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10/697,518

10/30/2003

Bruno Hans Haider

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GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
ONE RESEARCH CIRCLE
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EXAMINER

CATTUNGAL, SANJAY

ART UNIT

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3768

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/697,518
Filing Date: October 30, 2003
Appellant(s): HAIDER ET AL.

Patrick Patnode
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11/05/09 appealing from the Office action mailed 07/17/09.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,142,946	Hwang et al.	11-2000
5,893,363	Little et al.	4-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

1. **Claims 1, 2, 4, 5, 7, 8, 13, 14, and 21-27 rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent No. 6,142,946 to Hwang et al.**
2. Regarding **Claims 1, 13, 21, and 26** Hwang teaches a probe comprising: a plurality of transducers (Abstract Fig. 3 element 12); and a plurality of reconfigurable pulsers (Fig. 5 element 402, 404, 414, and 416) within said probe responsive to one or more transmit timing signals received from an external system to transmit pulses to said plurality of transducers (Fig. 3 element 30), wherein each reconfigurable pulser is coupled to a respective transducer (Fig. 5 element 402, 404, 414, and 416), and wherein said probe further includes a multiplexer that receives said timing signals from said external system and provides said signals to said plurality of transducers(Fig. 3 element 18).
3. Regarding **Claim 2**, Hwang teaches that the pulsers are responsive to low voltage analog transmit timing signal (Fig. 5 element 402, 404, 414, and 416, moreover the term "low voltage" is not defined in the specification, as such the broadest

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reasonable interpretation of the term "low voltage" is being used. As such any voltage being used in ultrasound transducers could be considered low voltage).

4. Regarding **Claim 4**, Hwang teaches a low voltage multiplexer configured to couple said transmit timing signals received from said external system to said pulser (Fig. 3 element 30 and 18; and Fig. 5 element 410).

5. Regarding **Claims 5 and 23**, Hwang teaches each transducer has a dedicated pulser (Fig. 5 element 402, 404, 414, and 416).

6. Regarding **Claim 7** Hwang teaches the use of a digital to analog converter (Fig. 4 element 338).

7. Regarding **Claim 8** Hwang teaches pulser are responsive to one or more transmit signals received from the imaging system (Fig. 5 element 408 and 410).

8. Regarding **Claim 14, 22, and 25**, Hwang teaches that the transducers are ultrasonic transducers and the system is an imaging system and comprises timing signals (Abstract and Figs. 1-5).

9. Regarding **Claims 24 and 27**, Hwang teaches sending control signals from the probe to the external system (Fig. 3).

Claim Rejections - 35 USC § 103

10. **Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang in view of Little (US 5,893,363).**

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11. Regarding **Claim 6** Hwang teaches all of the above claimed limitations but does not expressly teach pulsers to be bipolar, unipolar or combination of both and a conversion to set the timing signal to operate with low voltage pulsers.

12. Little teaches the drive signals for unipolar pulser (202) to each terminal of pulser as well as the complementary waveforms applied when bipolar signals are used (See Fig.5, Col. 5, lines 2-10).

13. It would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the pulsers of Hwang with the bipolar and unipolar pulsers as taught by Little in order to make both B-mode and Doppler imaging of the ultrasound machine possible.

(10) Response to Argument

Regarding Claim 1 applicant argues that Hwang does not teach or disclose a plurality of reconfigurable pulsers within said probe responsive to one or more transmit timing signals received from an external system to transmit pulses to said plurality of transducers, wherein each reconfigurable pulser is coupled to a respective transducer, and wherein said probe further includes a multiplexer that receives said timing signals from said external system and provides said signals to said plurality of transducers.

It is the examiner's position that Hwang teaches a plurality of transducers (Abstract and Fig. 3, element 12); and a plurality of reconfigurable pulsers (Fig. 5 element 402, 404, 414, and 416, moreover it is known in the art that every pulser in an ultrasonic probe is reconfigurable, since the timing signals are sent by the control unit

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which, controls the pulsers, as such all pulsers in an ultrasonic system which are controlled by a controller are reconfigurable), and wherein the probe further includes a multiplexer that receives said timing signals from said external system and provides said signals to the plurality of transducers (Fig. 3, elements 18 and 30).

Regarding Claim 13, applicant argues that Hwang does not teach or disclose an array of reconfigurable pulsers, each transducer responsive to pulses from a dedicated said reconfigurable pulser, wherein each reconfigurable pulser is coupled to a respective transducer; a low voltage multiplexer responsive to a control signal from an external system and configured to distribute signals to said array of reconfigurable pulsers; wherein said reconfigurable pulsers are responsive to said signals from said multiplexer to generate respective pulses to said transducers.

It is the examiner's position that Hwang teaches a plurality of transducers (Abstract, Fig. 3, element 12); and a plurality of reconfigurable pulsers (Fig. 5 element 402, 404, 414, and 416) within said probe responsive to one or more transmit timing signals received from an external system to transmit pulses to said plurality of transducers (Fig. 3 element 30), wherein each reconfigurable pulser is coupled to a respective transducer (Fig. 5 element 402, 404, 414, and 416; moreover it is known in the art that every pulser in an ultrasonic probe is reconfigurable, since the timing signals are sent by the control unit which, controls the pulser, as such all pulsers in an ultrasonic system which is controlled by a controller are reconfigurable), and wherein said probe further includes a multiplexer that receives said timing signals from said

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external system and provides said signals to said plurality of transducers (Fig. 3 element 18 and 30).

Regarding Claims 21 and 26, applicant argues that Hwang does not teach or disclose controlling a plurality of reconfigurable pulsers in a probe utilizing the one or more signals from the external system; and operating said plurality of transducers utilizing signals from said plurality of reconfigurable pulsers, wherein each reconfigurable pulser is coupled to a respective transducer.

It is the examiner's position that Hwang teaches a plurality of transducers (Abstract, Fig. 3 element 12); and a plurality of reconfigurable pulsers (Fig. 5 element 402, 404, 414, and 416) within said probe responsive to one or more transmit timing signals received from an external system to transmit pulses to said plurality of transducers (Fig. 3 element 30), wherein each reconfigurable pulser is coupled to a respective transducer (Fig. 5 element 402, 404, 414, and 416 moreover it is known in the art that every pulser in an ultrasonic probe is reconfigurable, since the timing signals are sent by the control unit which, control the pulser, as such all pulsers in an ultrasonic system which is controlled by a controller are reconfigurable), and wherein said probe further includes a multiplexer that receives said timing signals from said external system and provides said signals to said plurality of transducers (Fig. 3 element 18 and 30).

Appellant argues that Hwang reference fails to disclose that each of the plurality of pulsers is reconfigurable.

It is the examiner's position that Hwang teaches a plurality of reconfigurable pulsers (fig. 5 element 402, 404, 414, and 416), moreover it is known in the art that

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every pulser in an ultrasonic probe is reconfigurable, since the timing signals are sent by the control unit which, controls the pulser, as such all pulsers in an ultrasonic system which are controlled by a controller, are reconfigurable.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/SANJAY CATTUNGAL/

Examiner, Art Unit 3768

Conferees:

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Supervisory Patent Examiner, Art Unit 3768

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TC 3700 TQAS